

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (*Currently Amended*) An illumination apparatus for an optical instrument comprising:

an illumination means outputting illumination light; and

an optical element which is positioned on the light path of the illumination light outputted from the illumination means, the optical element comprising and which is made of organic/inorganic composite material,

wherinc the organic/inorganic composite material is made of organic component and inorganic component which are mixed in complex with each other.

2. (*Original*) An illumination apparatus for an optical instrument as claimed in claim 1, wherein organic component of the organic/inorganic composite material is a component having a glass-transition temperature higher than 150°C.

3. (*Original*) An illumination apparatus for an optical instrument as claimed in claim 1 or 2, wherein the organic/inorganic composite material contains at least one of the components represented by the following general formula (1) or (2):

General Formula (1)



wherinc R^1 and R^2 are the same or different organic groups, R^3 is an alkyl group, and alkyl halide group, and aryl group or an aryl halide group of which carbon number is between 1 and 6, and "a" and "b" are integers between 0 and 2 and "a+b" is an integer between 1 and 2;

General Formula (2)



(M^1 is at least one of metal elements which is selected from a group consisting of Al, Be, Ge, Fh, La, Mg, Sc, Ta, Ti, V, Y, Zn, and Zr, R^4 is an alkyl group, an alkyl halide group,

an aryl group or an aryl halide group of which carbon number is between 1 and 6, and "n" is a positive integer as a valence of the metal element M¹).

4. (*Original*) An illumination apparatus for an optical instrument as claimed in claim 1, wherein the organic/inorganic composite material contains a component having a glass-transition temperature higher than 150°C as its organic component and a component capable of transmitting lights in a range including the visible wavelength range and the ultraviolet wavelength range as its inorganic component.

5. (*Original*) An illumination apparatus for an optical instrument as claimed in claim 4, wherein the organic/inorganic composite material contains at least one of components represented by the following general formula (3) or (4):

General Formula (3)



wherein R¹ and R² are the same or different organic groups, R³ is an alkyl group, an alkyl halide group, and aryl group or an aryl halide group of which carbon number is between 1 and 6, and "a" and "b" are integers between 0 and 2 and "a+b" is an integer between 0 and 2;

General Formula (4)



(M² is at least one of metal elements which is selected from a group consisting of Al, Be, Hf, La, Mg, Sc, Y, and Zr, R⁴ is an alkyl group, an alkyl halide group, an aryl group or an aryl halide group of which carbon number is between 1 and 6, and "m" is a positive integer as a valence of the metal element M²).

6. (*Currently Amended*) An illumination apparatus for an optical instrument as claimed in ~~any one of claims 1 through 5~~ claim 1, wherein the illumination apparatus for the optical instrument is an illumination apparatus for a microscope.

7. (New) An illumination apparatus for an optical instrument as claimed in claim 1, wherein the organic/inorganic composite material is made of at least one structure selected from the group of:

- a. an IPN structure which is mixed in complex with each other on molecular level or nano-scale level and has a structure in which a polymer matrix formed of organic backbones and a matrix formed of inorganic backbones are interwoven and interpenetrated into each other.
- b. a composite structure, in which inorganic nano-scale fine particles are dispersed in a polymer matrix formed of organic backbones; and
- c. a copolymerized structure, in which a monomer or an oligomer formed of organic backbones and a monomer or oligomer having inorganic element are copolymerized.